

**CRITICAL SUCCESS FACTORS IN IT PROJECTS:
CHALLENGES AND EFFECTIVENESS**

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ABSTRACT

Information Technology (IT) projects have bigger contribution to the country economy and development. However, IT project management is a crucial task because many IT projects failed due to project delayed, over budget or not achieved the planned scope. The main objectives of this research are identifying critical success factors in IT projects and to investigate the challenges and effectiveness of the critical factors in IT projects. Meanwhile, this research also investigates the relationships between critical success factors and IT project success. A research framework with 7 critical success factors was developed based on the thorough literature review. These 7 factors are collected based on their importance to IT projects and their repeated occurrence in the literature related to the critical success factors. Surveying method has been used to collect data and the data collected are being analysed by using Statistical Package for the Social Sciences (SPSS) software. The respondents are selected from the IT companies that are located in Kuala Lumpur and Selangor with a Multimedia Super Corridor (MSC) status under the InfoTech group. This research is useful for IT companies where project managers can benefit from the mentioned critical success factors by concentration on them while planning and executing IT projects. From the results, it is observed that there are positive significance relationships between two (2) critical success factors and IT project success. Therefore, the results are significant to enhance the success rates of IT projects in Malaysia.

ABSTRAK

Projek informasi teknologi (IT) memberikan sumbangan penting kepada ekonomi negara dan juga pembangunan. Walau bagaimanapun, pengurusan dalam projek IT merupakan satu tugas yang penting kerana banyak projek IT gagal atas sebab ditangguhkan, lebih bajet atau tidak mencapai skop yang dirancang. Objektif utama bagi kajian ini adalah untuk mengenal pasti faktor-faktor kejayaan kritikal dalam projek IT dan untuk menyiasat cabaran serta keberkesanan faktor-faktor kritikal dalam projek IT. Di samping itu, kajian ini juga ingin mengetahui hubungan antara faktor-faktor kejayaan kritikal dengan kejayaan projek IT. Satu rangka kerja untuk kajian ini telah ditentukan dengan 7 faktor kejayaan kritikal berdasarkan kajian literatur yang menyeruluh. 7 faktor ini telah dipilih berdasarkan kepentingannya untuk projek IT dan berulangannya mereka dalam kajian lepas yang berkaitan dengan faktor-faktor kejayaan kritikal. Kaedah kaji selidik telah digunakan untuk mengumpul data and data yang diperoleh telah dianalisis dengan menggunakan Pakej Statistik untuk Sains Sosial perisian (SPSS). Responden yang terpilih adalah terdiri daripada syarikat-syarikat yang terletak di Kuala Lumpur dan Selangor dengan status Multimedia Super Corridor (MSC) di bawah kumpulan InfoTech. Kajian ini amat bermakna kerana pengurus projek dapat focus faktor-faktor kejayaan kritikal tertentu ketika merancang dan melaksanakan projek IT. Keputusan kajian ini menunjukkan bahawa terdapat dua (2) faktor kejayaan kritikal mempunyai pertalian yang signifikan positif dengan kejayaan projek IT. Jadi, keputusan kajian ini dapat meningkatkan kadar kejayaan projek IT di dalam Malaysia.

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LIST OF ABBREVIATIONS

ERP	Enterprise Resource Planning
ICT	Information and Communications Technology
IHL	Institutes of Higher Learning
IT	Information Technology
KL	Kuala Lumpur
KPIs	Key Performance Indicators
MSC	Multimedia Super Corridor
PM	Project Management
PMI	Project Management Institute
PMPA	Project Management Performance Assessment
SPSS	Statistical Package for the Social Sciences
VIF	Variance Inflation Factor

CHAPTER 1

INTRODUCTION

1.1 INTRODUCTION

In this fast development world, information technology (IT) playing an important role in supporting organizations' businesses. There are many factors can contribute to a successful IT project such as team factors, technical factors, organizational factors and so forth. Therefore, it is important for IT companies to identify the critical success factors that are most effective to their IT projects. Sudhakar (2012) claims that project managers should emphasize on multi factor model for critical project success factors as well as examine the relative importance among those factors.

This chapter will provide general information and ideas of this study. Then, a brief explanation on problem background and problem statement will also be included. Besides that, the objectives of research, research questions and scope will be covered. Lastly, the importance of this research will be cited in the significance of study.

1.2 PROBLEM BACKGROUND

IT projects have affects organizations in the way of making investments since the world has realized that it can create competitive advantages in the market. However, there are many IT projects around the world have failed because of lacking guidelines on manage IT projects. IT project management is a crucial task as many IT projects failing to achieve their intended results (Latendresse and Chen, 2003). 30 per cent to 70

percent of IT projects will be delayed, over budget or not achieved the planned scope (Bowers, 2009).

The IT sector has contributed to the development of Malaysia's economic. Although IT investment brings benefits, however, IT projects are mostly known to face a lot of challenges and the projects might be out of control, since it is tough to fulfill the projects' justifications. This is because most companies have limited knowledge of what contributes to the success of an IT project (Aladwani, 2002). The demand of an IT project to be no errors is still a challenge to the IT industry.

1.3 PROBLEM STATEMENT

In this day and age, IT project management has become a crucial issue for companies. A large number of IT projects fail and are not achieved to completion. According to a comprehensive report by The Standish Group (1999) that presents data on 23,000 IT projects from 1994 to 1998, 31 percent of IT projects failed in 1994, 40 percent were unsuccessful in 1996, and 28 percent were cancelled in 1998. Table 1.1 shows some history of IT project's failure from year 2000-2011. Basically, there are many resources that can be saved by enhancing the success rate of the IT projects. If an IT project manager is aware of the critical success factors of his or her project, the success rate of his or her project can be increased. As a result, finding the critical success factors that can be implemented for IT projects help to minimise the failures of IT projects.

Table 1.1: History of IT project's failure

Year	Company	Outcomes (Costs in US \$)
2011	CareSource Management	CareSource is demanding at least \$1.5 million in damages.
2011	TechnoDyne	Cost overruns and a criminal probe into an alleged kickback scheme. TechnoDyne executives have been charged.
2005	Hudson Bay Co. [Canada]	Problems with inventory system contribute to \$33.3 million loss.

Table 1.1: Continued

Year	Company	Outcomes (Costs in US \$)
2004-05	UK Inland Revenue	Software errors contribute to \$3.45 billion tax-credit overpayment.
2004	Avis Europe PLC [UK]	Enterprise resource planning (ERP) system cancelled after \$54.5 million is spent.
2004	Ford Motor Co.	Purchasing system abandoned after deployment costing approximately \$400 million.
2004	J Sainsbury PLC [UK]	Supply –chain management system abandoned after deployment costing \$527 million.
2003-04	AT&T Wireless	Customer relations management upgrades problems lead to revenue loss of \$100 million.
2002	McDonald's Corp.	The Innovate information-purchasing system cancelled after \$170 million is spent.
2002	Sydney Water Corp. [Australia]	Billing system cancelled after \$33.2 million is spent.
2002	CIGNA Corp.	Problems with CRM system contribute to \$445 million loss.
2001	Nike Inc.	Problems with supply-chain management system contribute to \$100 million loss.
2001	Kmart Corp.	Supply-chain management system cancelled after \$130 million is spent.
2000	Washington D.C.	City payroll system abandoned after deployment costing \$25 million.

Source: Kanaracus (2011) and Charette (2005)

1.4 RESEARCH OBJECTIVES

The objectives of this research are:

- i. To identify critical success factors in IT projects

- ii. To determine the challenges in IT projects
- iii. To assess the effectiveness of critical factors in IT projects
- iv. To investigate the relationship between critical success factors and IT project success

1.5 RESEARCH QUESTIONS

This research is carried out to seek answers for:

- i. What are the critical success factors in IT projects?
- ii. What are the challenges in IT projects?
- iii. Which critical factor is more effective in IT projects?
- iv. What is the relationship between critical success factors and IT project success?

1.6 RESEARCH HYPOTHESIS

- Change management playing a crucial role on effective balancing of forces in order to overcome forces of resistances if any changes happened during project. Change management is a necessary consideration in implementation of a project (Finney and Corbett, 2007).
- H1:** There is a positive significant relationship between change management and culture program and the IT project success.
- IT project must receive approval or support from top management before it can be proceeding. The willingness of top management to support the IT project is important on the aspect of resources allocation. Young and Jordan (2008) have proved that top management support is the most important factor for project success.
- H2:** There is a positive significant relationship between top management support and the IT project success.

- A clearly defined and documented plan and vision helps the project process becomes smooth in order to achieving success. Mirza et al. (2013) stated that there is almost impossible for achieving success if without an agreed upon and documented vision.
- H3:** There is a positive significant relationship between business plan and vision and the IT project success.
- In different stages of implementation, companies are able to plan, coordinate and monitor various activities with effective project management. Mir and Pinnington (2014) had proved that there is a statistically positive relationship between project management performance and project success in their research.
- H4:** There is a positive significant relationship between project management and IT project success.
- With project champion, there are many project's technological and strategic issues can be solved. Project champion is important in achieving project success as he or she can facilitates and enhance team motivation (Françoise et al., 2009).
- H5:** There is a positive significant relationship project champion and IT project success.
- Expectations or targeted goals at every level should be communicated. Complete and open communication ensures honesty and helps to achieve IT project success. Hyväri (2006) founds that communication is significantly contribute to the success of information system project.
- H6:** There is a positive significant relationship between communication and IT project success.
- An IT project can be considered as success when it is completed and fulfill the expectations of stakeholders in terms of time, cost, scope and quality. Mahaney

and Lederer (2010) stated that the purposes of monitoring are ensure that a project is progressing within acceptable budget, schedule and quality expectations.

H7: There is a positive significant relationship between monitoring and evaluation of performance and IT project success.

1.7 SCOPE

The population of this study is referred to status companies in online database of Multimedia Super Corridor (MSC) Malaysia. The companies are being classified into five clusters which are creative multimedia, IHLs and incubators, IHLs and amp; incubators, InfoTech and shared services outsourcing. However, the population of this study is only referring to IT companies have been listed in the online database under group “InfoTech” (accessible online at http://www.msomalaysia.my/status_company) and located at the area of Kuala Lumpur (KL) and Selangor. This is because most of the IT companies are located at KL and Selangor where the development in IT fields are fast compared to other states. For example, there is several IT zones can be found in these two places such as Cyberjaya, Putrajaya, Petaling Jaya, Bangsar South and so on.

1.8 SIGNIFICANCE OF STUDY

This research will propose a guideline for IT industry to manage their IT projects. The outcomes of the study helps IT industry to know what are the critical factors need to be considered in order to make project success. Besides that, they can also know about the effectiveness of each factors as well as challenges to achieve success in IT projects. Therefore, this study is intended to carry out to increase the number of successful IT projects in Malaysia.

1.9 OPERATIONAL DEFINITION

1.9.1 Information Technology (IT) Project

According to Marchewka (2010), IT projects are organizational investments. It is done to support every possible industry and business function. It is different from other projects and is typically emphasis on computer technology such as hardware and software.

1.10 EXPECTED RESULTS

From this research, I am expecting that I would be able to identify the critical success factors in IT projects. Besides that, this research also aim to know about which challenges and critical success factors contributes the most to IT projects. Last but not least, I also expect that the relationships between variables can be proved throughout the research. Thus, it can be used as references for IT companies to enhance their IT projects.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

The purpose of this chapter is to provide a more detail information and review of studies relevant to this research topic. This chapter explains definition of project success, factors that contribute to IT project success as well as challenges and problem arise in managing IT projects. Last but not least, this chapter also provides the theoritical framework of this research.

2.2 PROJECT SUCCESS

There are many meanings for the project success. A project can be considered as success if it is achieve the requirements or expectations of stakeholders. According to Prabhakar (2008), the project success in any organization is assessed by different types of stakeholders such as employees and customers. He also said that project manager plays an important role in making a project success.

Project success can also define as the achievement of project completion on time, within budget and achieving predefined project goals. Andersen et al. (2006) stated that the project success is the achievement of intended outcomes in terms of budget, time and specification. Marshall (2007) claims that project success is an achievement that involves meeting schedule, budget goals, benefit to customer, preparing for future as well as the commercial success.

According to Sudhakar (2012), project success is include two components which are project management success and project product success. Figure 2.1 shows the concept of project success. Therefore, project can count as success not only if finished with target cost, schedule, meet customer satisfaction and functionality but it also means the project is execute efficiently and effectively (Sofian, 2003).

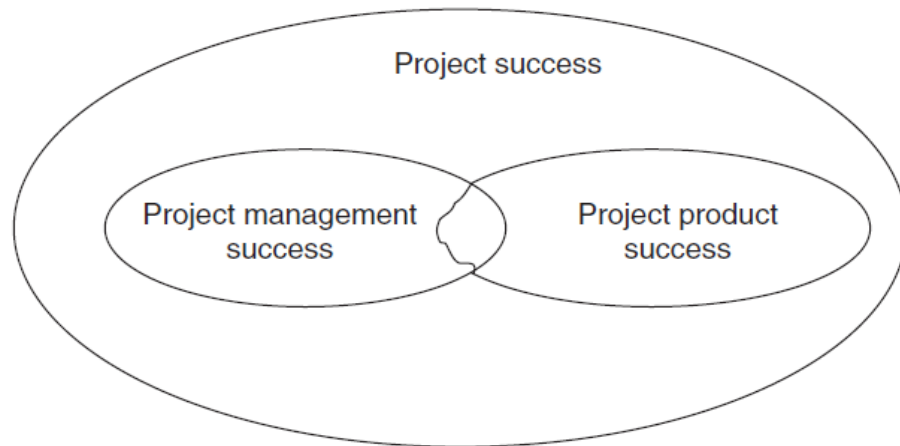


Figure 2.1: The meaning of project success

Source: Sudhakar (2012)

2.3 CRITICAL FACTORS THAT CONTRIBUTE TO THE SUCCESS OF IT PROJECTS

There are many researchers had identified critical success factors that contribute to the success of IT projects. Wong and Tein (2004) have determined 23 critical success factors for projects of Enterprise Resource Planning (ERP) system. Pinto and Slevin have conducted a survey of 418 Project Management Institute (PMI) members in finding the critical success factors in the stage of project implementation (Prabhakar, 2008). Besides that, Belassi and Tukel have categorized the factors that can affect the performance of project into organization, project, team members, project managers and external environment (Prabhakar, 2008). Table 2.1 shows the review of critical success factors for IT projects.

Table 2.1: Review of critical success factors for IT projects

	Change Management and culture program	Top management support	business plan and vision	project management	project champion	communication	Monitoring and evaluation of performance
Fiona, Kathryn, and Janet (2009)	✓	✓	✓	✓	✓	✓	✓
Finney and Corbett (2007)	✓	✓	✓	✓	✓	✓	
Ngai, Law, and Wat (2008)	✓	✓	✓	✓	✓	✓	✓
King and Burgess (2005)		✓		✓	✓		
Noé and Luis E. (2007)	✓	✓	✓	✓	✓	✓	
Soja (2006)		✓					✓
Hong (2007)		✓		✓		✓	
Olson and Zhao (2007)		✓	✓	✓	✓	✓	
Francoise, Bourgault and Pellerin (2009)	✓	✓	✓	✓	✓	✓	✓
Jafari, Osman, Yusuff, and Tang (2006)		✓		✓		✓	
Jing and Qiu (2007)		✓		✓		✓	
Jiang (2005)		✓		✓			
Al-Fawaz, Al-Salti and Eldabi (2008)		✓	✓	✓	✓		
Ngai, Cheng and Ho (2007)		✓				✓	
Number of citations	5	14	7	12	8	10	4

2.3.1 Change Management and Culture Program

A project might consist of uncertainties that are difficult to be predicted. Hence, change management is becoming an increasingly important subject because it helps to deal with the uncertainties. Finney and Corbett (2007) said that change management is a necessary consideration in implementation of a project. The change management program should create a culture with shared values and common objectives, focus on quality, train users and involve them in the system design. A culture with shared values and a good corporate identity that is benefits to change is crucial (Nah et al., 2009).

Françoise et al. (2009) stated the actions should be taken to support this factor are:

- i. Formally getting support from opinions leaders
- ii. Make sure the executives adopt the new systems
- iii. Assess the organization's capacity in order to accept change
- iv. Provide a complete training
- v. Determine the risks and develop mitigation plans
- vi. Evaluate the scope of change regularly

- vii. Circulate information on the benefits and changes
- viii. Control expectations that are related to system's functionalities
- ix. Start the transition when the organization is ready
- x. Reduce resistance to change at an early stage
- xi. Maintain employees' motivation along the project
- xii. Set up conference room pilots during the project

2.3.2 Top Management Support

Top management support has been widely recognized because they are the persons who make the investment decision. Without commitment of resources from top management, an IT project cannot be proceeding well. In the research of Young and Jordan (2008), they have proved that top management support is the most important factor for project success. They denied qualified, focused and hardworking project member as the crucial part for project success. It is suggested that quality of top management support determine the project success once an elementary level of competency has been recruited. Besides that, they also recommend that top managers should transparent in resolving problems and issues between different user priorities.

Top management support is critical during the project planning stage for finalize the project's total budget. Belout and Gauvreau (2004) mentioned about roles of top management in the process of negotiations with external and internal stakeholders, formation process of project team as well as the determination of work processes. They conclude this factor is necessary to success the subsequent operations. Top management support should direct the implementation teams and monitor the project progress at the same time (Al-Fawaz et al., 2008). Therefore, top management should support full implementation of project and does not end with initiation and facilitation.

2.3.3 Business Plan and Vision

There are many projects start with good ideas but failed in the end. One of the reasons for this scenario to happen is lack of defining project and product scope at the early stage of project. According to Mirza et al. (2013), there is almost impossible for

achieving success if without an agreed upon and documented vision. It is important for each project to clearly plan and specify its scope in order to let the project carry out in a coordinated manner. In the research of Olson and Zhao (2007), business vision was chosen by most organizations in the assessment phase as one of the critical success factors for ERP system upgrading project. Schwalbe mentioned that the three competing and interrelated goals in the project management are scope, cost and time (Al-Fawaz et al., 2008). Therefore, a conceptualization of the goals and possible ways to strive the targeted goals should be identified in the early stage of any project. At the same time, the business plan and vision should be explained clearly in order to indicate the general directions of the IT project.

2.3.4 Project Management

According to PMBOK 4th Edition, a project can be defined as a temporary endeavor undertaken to create a unique product, service, or result. Project Management (PM) is important for any IT project and it can be assessed by using project management performance assessment (PMPA) model (Mir and Pinnington, 2014). The integral parts of PMPA model are PM leadership, PM staff, PM policy and strategy, PM partnerships and resource, Project life cycle management processes and PM Key Performance Indicators (KPIs). Mir and Pinnington (2014) have proved that there is a statistically positive relationship between PM performance and project success in their research. PM staff and PM leadership have high contribution towards the project success. Woo (2007) identified project management as one of the critical success factors for implement ERP system. As a result, IT project should led by a good project manager with plans and schedules.

2.3.5 Project Champion

At the early stage of every project, the hopes and expectations might be very high. Unfortunately, some projects are missing the timelines, fail to deliver the objectives, exceed the budget and so on. Hence, project champion is needed because he or she is the person who ensuring everyone involved is on board to achieve the project

success. Bowen et al. (2007) found that project champion can aid significantly in managing IT development processes as well as monitoring IT operations quality.

Besides that, Françoise et al. (2009) also mentioned that project champion is important in achieving project success because he or she can facilitates and enhance team motivation. Project champion also helps to develop enthusiasm and convergence on common goals. Tan et al. (2009) conclude that a senior manager is needed to champion the project. The stress comes from work may decrease employees' morale and hence project champion is needed to motivate the team members during the project.

2.3.6 Communication

A successful project manager must have a good communication skill. According to the Project Management Institute (PMI) report, Pulse of the Profession (2013), 55 percent of project manager have the same point of view which is effective communication to all stakeholders is the most critical success factor in project management. This report also revealed that ineffective communications leads to fewer successful projects. Figure 2.2 shows the result of a research from PMI that is organizations with minimally-effective communicators report significantly fewer projects that meet original goals, come in on time and finishing on budget.

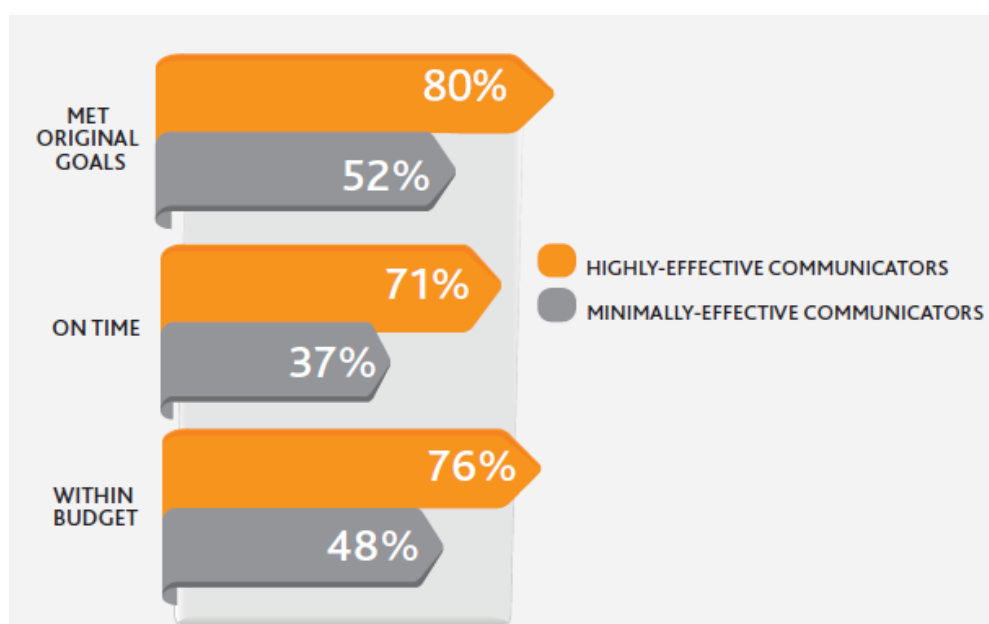


Figure 2.2: Organizations that communicate more effectively have more successful projects

Source: Project Management Institute, PMI (2013)

Hyväri (2006) founds that communication in project teams is a significant success factor in bigger companies. Communication is one of the most important success factors in the information system project (Hyväri, 2006). As a project manager, he or she needs to plan and coordinate many efforts rather than to perform them. However, the collaboration is needed from stakeholders and other staff that do not work for the project manager. These factors point to the communication as an essential skills for project success (Kappelman et al., 2006).

2.3.7 Monitoring and Evaluation of Performance

Monitoring is a continuous process used to keep track the progress of project whereas evaluation is a periodic activity used to assess whether the performance of an activity or a project has achieving its intended goals. The fast changing and developing in IT environment has becomes a challenge for IT projects. Therefore, monitoring and evaluation of IT project's performance is important because new projects might continually use little known technologies. Mahaney and Lederer (2010) stated that the purposes of monitoring are ensure that a project is progressing within acceptable budget, schedule and quality expectations; supports decision as well as confirms subjective assessments. Ngai et al. (2008) stated that the monitoring and evaluation of performance is a critical success factor for any IT system. Hence, implementation progress must be measured periodically for effective control.

2.4 CHALLENGES IN IT PROJECTS

“Failure teaches succeed”. Before reaching to success, there is always having some problems or challenges. Hence, it is very important to know the challenges during managing IT projects. There are very little amount of researchers identify the current